

SP 20
Log 1756

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: October 23, 1985

Forwarded to:

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-85-87

On June 16, 1984, a Cessna Model 172K, N84103, crashed at Bridgeport, Texas, after sustaining an engine failure during cruise flight. The National Transportation Safety Board's investigation of the accident disclosed that the engine failed after the diaphragm of an oil pressure switch ruptured and allowed rapid depletion of the engine oil supply. The switch, Datcon part No. 40558-1, was installed on January 1, 1974, directly into the engine block (tapped oil gallery hole) and was used in connection with electrical actuation of the airplane's hourmeter.

The Datcon Instrument Company, original distributors of Datcon oil pressure switches, purchased them from Fasco Industries, Incorporated. In a letter of November 12, 1974, to aircraft supply distributors and airframe manufacturers, Datcon recalled the switches because of possible manufacturing defects. While no defects were evidenced, Datcon did find during the course of the recall that a number of the switches had been installed, like the one in N84103, directly into the airplane engine block. This, according to Datcon, is an improper installation which can subject the switch to high oil pressure pulsations and lead to fatigue failure of the switch contacts and subsequent rupture of the diaphragm.

On January 2, 1975, Datcon issued Service Bulletin No. 1, "Hazardous Installation of Oil Pressure Switches." The bulletin, referring to improper installation of the switches directly into the engine block, indicated that the switches were to be installed only as follows:

Recommended Installation Method: The oil pressure switch for hour-meter actuation shall be installed off the line to the mechanical oil pressure gauge with an AN type "T" fitting or equivalent. This shall be supported on the firewall. Thus, the switch and gauge are isolated from the engine and protected from pressure surges by the flexible hose in this line and the flow-restricting orifice in the engine side of the line. If a flow-restricting orifice is not provided at the engine end of the line to the gauge, contact the aircraft manufacturer for proper installation method before installing switch.

Shortly after this bulletin was issued, Datcon discontinued sales of these switches.

Service Difficulty Reports from the Federal Aviation Administration's Maintenance Analysis Center disclosed the failure of two similar switches during 1984. The text of one report referring to a Datcon switch indicated that the "oil pressure switch diaphragm ruptured." The other report regarding a Hobbs oil pressure switch stated: "oil loss and smoke in cabin. Found electrical prongs on oil pressure transmitter loose and corroded." The Hobbs oil pressure switch is made by Hobbs, a division of the Stewart Warner Corporation.

Fasco Industries, Incorporated manufactures oil pressure switches similar to the Datson switch and is an approved supplier for the Cessna Aircraft Company. However, Fasco currently is not marketing the switches for use in aircraft.

When hourmeters are installed by Cessna, the accompanying oil pressure switch (currently Hobbs) usually is mounted in the oil pressure line at the engine firewall. Moreover, the same oil pressure switch mounting location is specified when hourmeters are furnished in Cessna Accessory Kits for installation in the field. The Piper Aircraft Corporation installs the oil pressure switch in a similar manner.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive requiring the removal and disposal of Hobbs, Datcon, and similar hourmeter oil pressure switches mounted directly to an airplane's engine and prescribing that new switches, if installed, be mounted in the oil pressure line at the engine firewall or at another appropriate location as recommended by the airframe manufacturer. (Class II, Priority Action) (A-85-87)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in this recommendation.

By: 
Jim Burnett
Chairman